

Please substitute the enclosed corrected drawings and new sequence listing for that previously filed.

IN THE CLAIMS

1. (Original) A process for detecting an analyte in a sample to be assayed comprising the steps of:

(a) providing a porous semiconductor substrate having a bound binder compound that forms a binder compound-bound substrate and determining the wavelength of the Fabry-Perot fringes upon illumination of said binder compound-bound substrate;

(b) contacting said binder compound-bound substrate with a sample to be assayed, said analyte present in said binding to said binder compound to form a ligand-bound substrate; and

(c) thereafter reilluminating said substrate; whereby a shift in the wavelength maximum of the Fabry-Perot fringes indicates the detection of said analyte in the sample.

2. (Original) The process of claim 1 wherein said porous semiconductor substrate is silicon.

3. (Original) The process of claim 1 wherein said binder compound is an organic molecule.

4. (Original) The process of claim 1 wherein said analyte is an organic molecule.

5. (Original) A process for detecting an organic molecule analyte in a sample to be assayed comprising the steps of:

(a) providing a porous silicon semiconductor substrate having a bound binder compound that forms a binder compound-bound substrate and determining the wavelength of the Fabry-Perot fringes upon illumination of said binder compound-bound substrate;

(b) contacting said binder compound-bound substrate with a sample to be assayed, said organic molecule analyte present in said sample binding to said binder compound to form a analyte-bound substrate; and

(c) thereafter reilluminating said substrate; whereby a shift in the wavelength maximum of the Fabry-Perot fringes indicates the detection of said organic molecule analyte in the sample.

6. (Original) The process of claim 5 wherein said provided substrate is prepared by the steps of:

- (a) etching said substrate; and
- (b) washing said etched substrate.

7. (Original) The process of claim 5 wherein said binder compound is selected from the group consisting of peptides, antibodies, antigens, DNA, RNA, ligands that bind to metal ions and enzymes.

8. (Original) The method of claim 5 wherein said contacting of step (b) is carried out in an aqueous, liquid medium.

9. (Original) A process of quantitatively detecting organic analyte molecules in a sample comprising the steps of:

- (a) preparing a porous silicon semiconductor substrate;
- (b) contacting said substrate with a binder compound to form a binder compound-bound substrate and determining the wavelength of the Fabry-Perot fringes upon illumination of said binder compound-bound substrate;
- (c) introducing a sample having an unknown concentration of an organic molecule analyte at a plurality of dilutions and measuring the shift in wavelength of the Fabry-Perot fringes at said dilutions to prepare a first dose response curve of the unknown concentration of the organic molecule analyte;
- (d) providing a second, standard, dose response curve of Fabry-Perot fringe wavelength shifts of known concentrations of the organic molecule analyte; and
- (e) comparing said first curve with said second curve on a log vs. log plot to thereby obtain the concentration of said organic molecule analyte in said sample.

10-24 (Cancelled).

25. (Original) A process for detecting a target species in a sample to be assayed comprising the steps of

- (a) selecting an assay sensor for the target species, the selected assay sensor comprising a layer of porous semiconductor and a binder material intimately associated therewith, said binder material specifically binding the target species, said layer of a thickness selected to generate Fabry-Perot fringes from the reflection of light therefrom, said Fabry-Perot fringes having a first set of peak wavelengths in the absence of the target species and a second

set of peak wavelengths in the presence of the target species;  
and

(b) reflecting light off of the porous surface of the selected assay sensor in the presence of said sample and determining the presence or absence of the target species in the sample from the Fabry-Perot fringes in the reflected light.

26. (Original) The process of claim 25 wherein the porous semiconductor comprises porous silicon.

27. (Original) The process of claim 26 wherein the target species is an organic target species.

28. (Original) The process of claim 25 wherein said light comprises visible light.

29. (Original) The process of claim 25 wherein said light is white light.

30. (Original) The process of claim 25 wherein said light comprises infrared light.

31. (Original) The process of claim 25 wherein said light comprises ultraviolet light.

32 (Cancelled).